Site Assessment Essentials

EPA Region III

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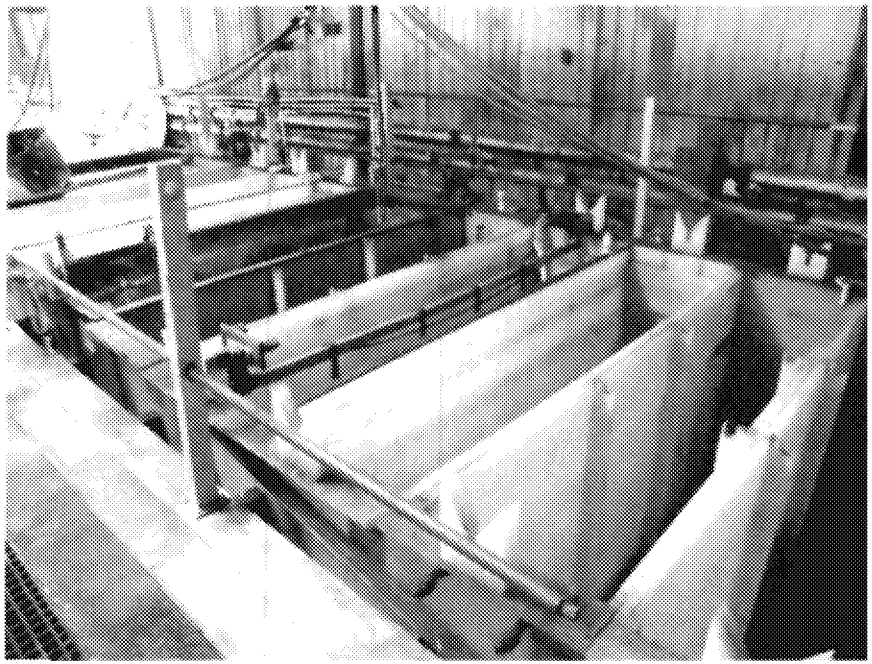
CASE STUDY ABOUT PFAS
BLADES GROUNDWATER

Introduction to Site Assessment

- EPA conducted a site review in cooperation with and on behalf of the State's VCP program to investigate the PFAS contamination in Blades, DE.
- EPA's removal and site assessment programs responded to the contamination.

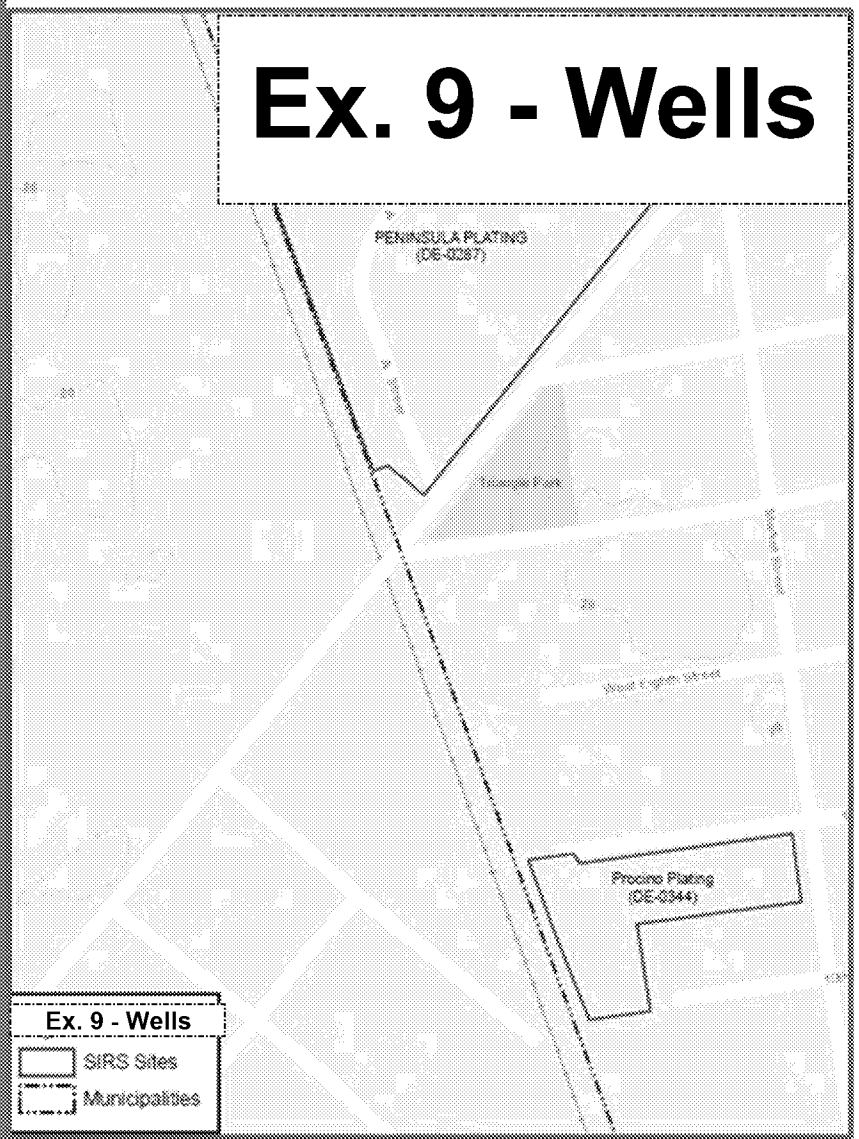


Identification of the Blades Site

- EPA conducted a site review as part of the State lead remedial investigations.
- *Fumetrol* 140 and chromium tetrafluoroborate use at two electroplating facilities.

Fumetrol 140 - Specific Gravity:1.025
ORGANIC FLUOROSULFONATE 7% by volume

Targets for the Blades GW Site



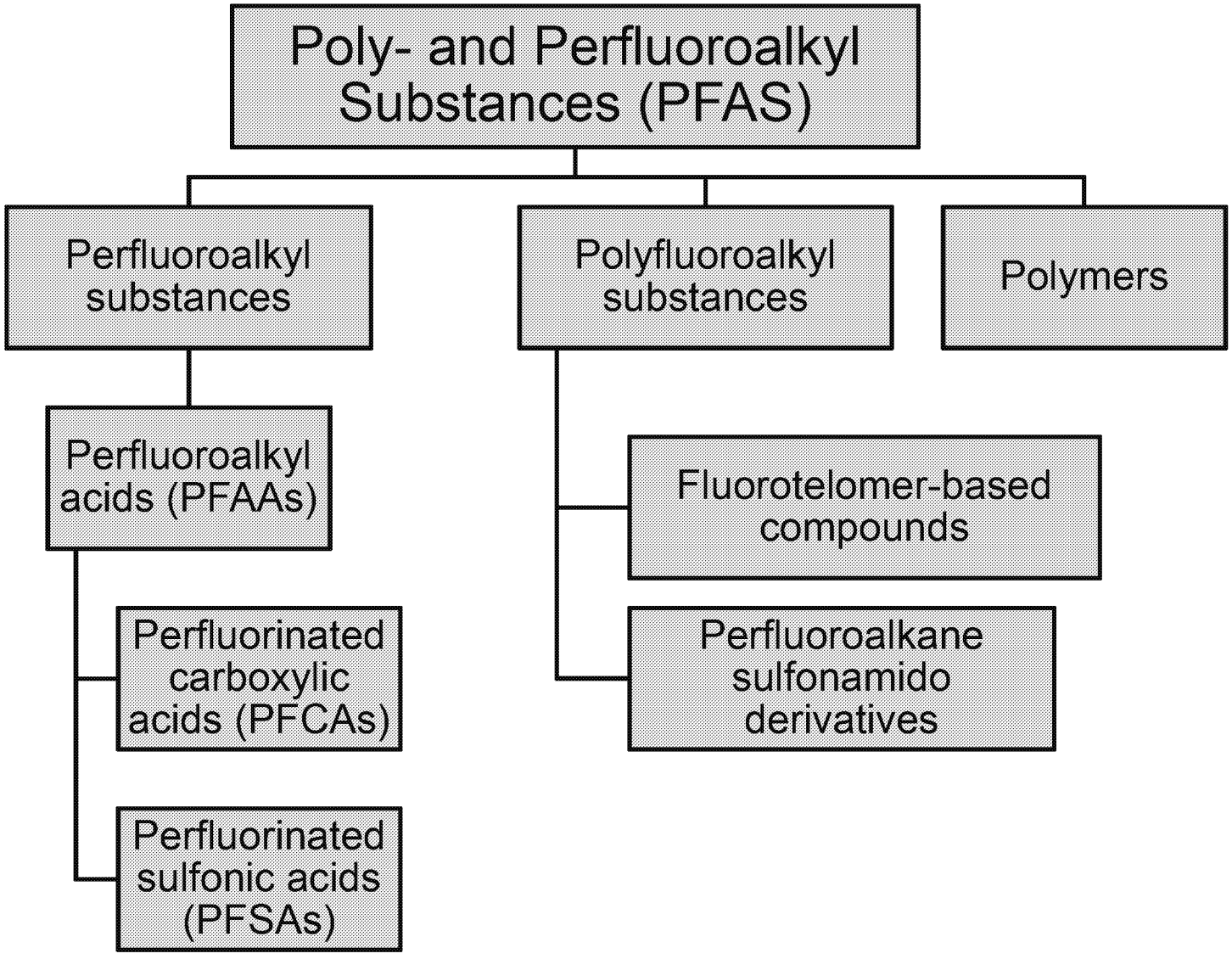
Ex. 9 Wells & Ex 6 PII

Impacted:

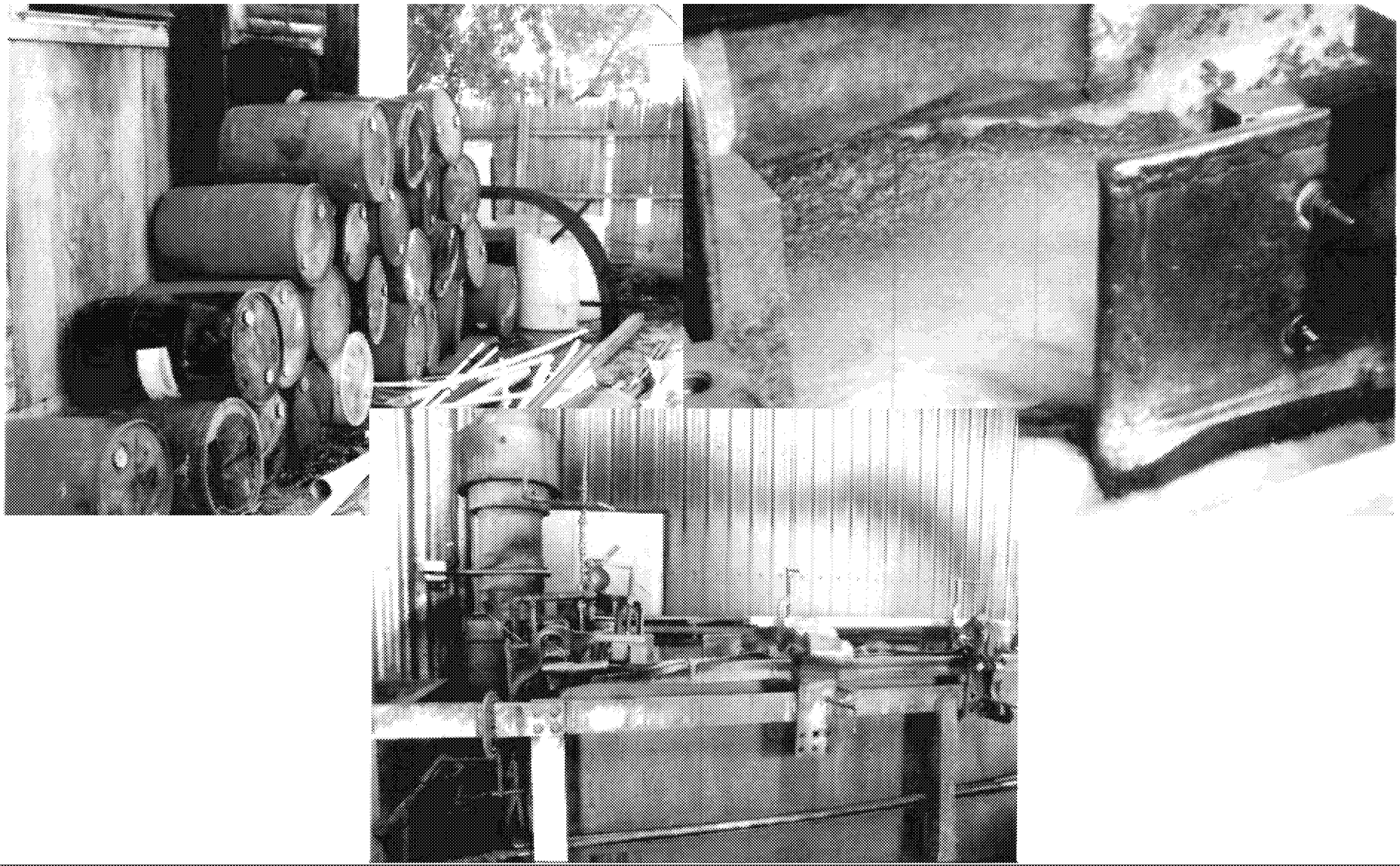
- Three Public Wells
- Nine Residential Wells
- Sediments of Morgan Branch

Investigation of the Blades Site

- Further assessment is continuing to determine the source(s) of this contamination.
- The contamination from both facilities may be comingled containing PFAS, chromium, and cyanide.
- Both facilities have used multiple types of plating processes.


Poly- and Perfluoroalkyl Substances (PFAS)
Perfluoroalkyl substances
Polyfluoroalkyl substances
Polymers
Perfluoroalkyl acids (PFAAs)
Perfluorinated carboxylic acids (PFCAs)
Perfluorinated sulfonic acids (PFSAs)
Fluorotelomer-based compounds
Perfluoroalkane sulfonamido derivatives

Site Assessment Photographs



Investigation of the Blades Site

- Sample Results
  - 3 wells had results exceeding the combined PFOA/PFOS - HAL.
    - Drinking Water - 193.0, 117.5, and 96.2 (ppt)
  - Nine residential wells had concentrations above the HAL. Delaware installed treatment for the wells.
  - One residential well had a concentration of 364 ppt.

- EPA still conducting assessment of the groundwater plume.
  - Known contamination of the groundwater and soil.
  - Threats to the surface water (human food chain, wetlands).
  - Inadequate controls and no remediation of groundwater to date.
  - Abundant potential source soils at the two facilities.

Investigation Considerations and PFAS Facts

Regulation:

- U.S. Environmental Protection Agency (U.S. EPA) drinking water lifetime health advisory for the sum of PFOA and PFOS of 70 ng/L.
- The State of Delaware has designated PFOA and PFOS a hazardous substances as of July, 2018 and requires an investigation within 1,000 feet of affected facilities.

Mapping/Geospatial:

- Extent of potential affects. Maximum concentrations and magnitude of affect.
- Lithological layers - higher permeability units, confining units.
- Affected wells, affected rivers and wetlands i.e. (Targets and Receptors)

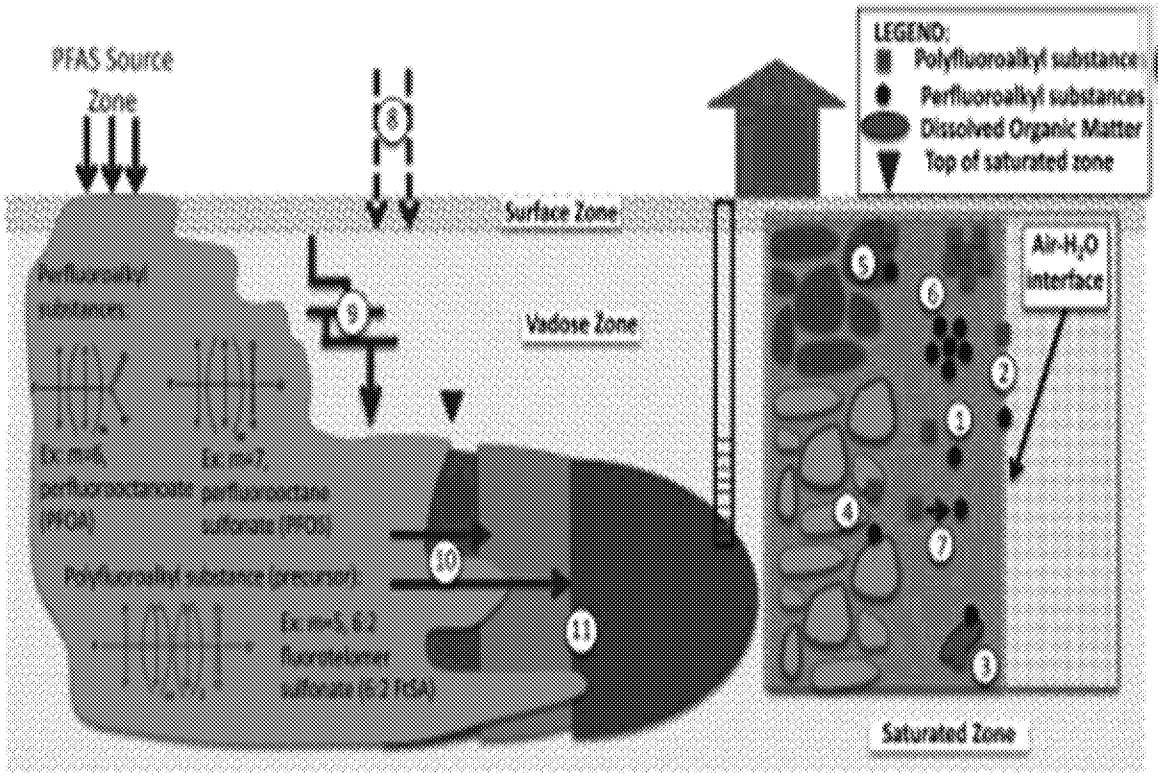
Fate:

- PFASs is highly water soluble with weak soil sorption and exhibit recalcitrance to natural degradation, leading to the potential for large but narrow groundwater plumes.

Transport:

- Transport in sandy lithological layers and higher permeability units and confining units.
- PFAS compounds flow readily with a density close to water.
- High solubility.

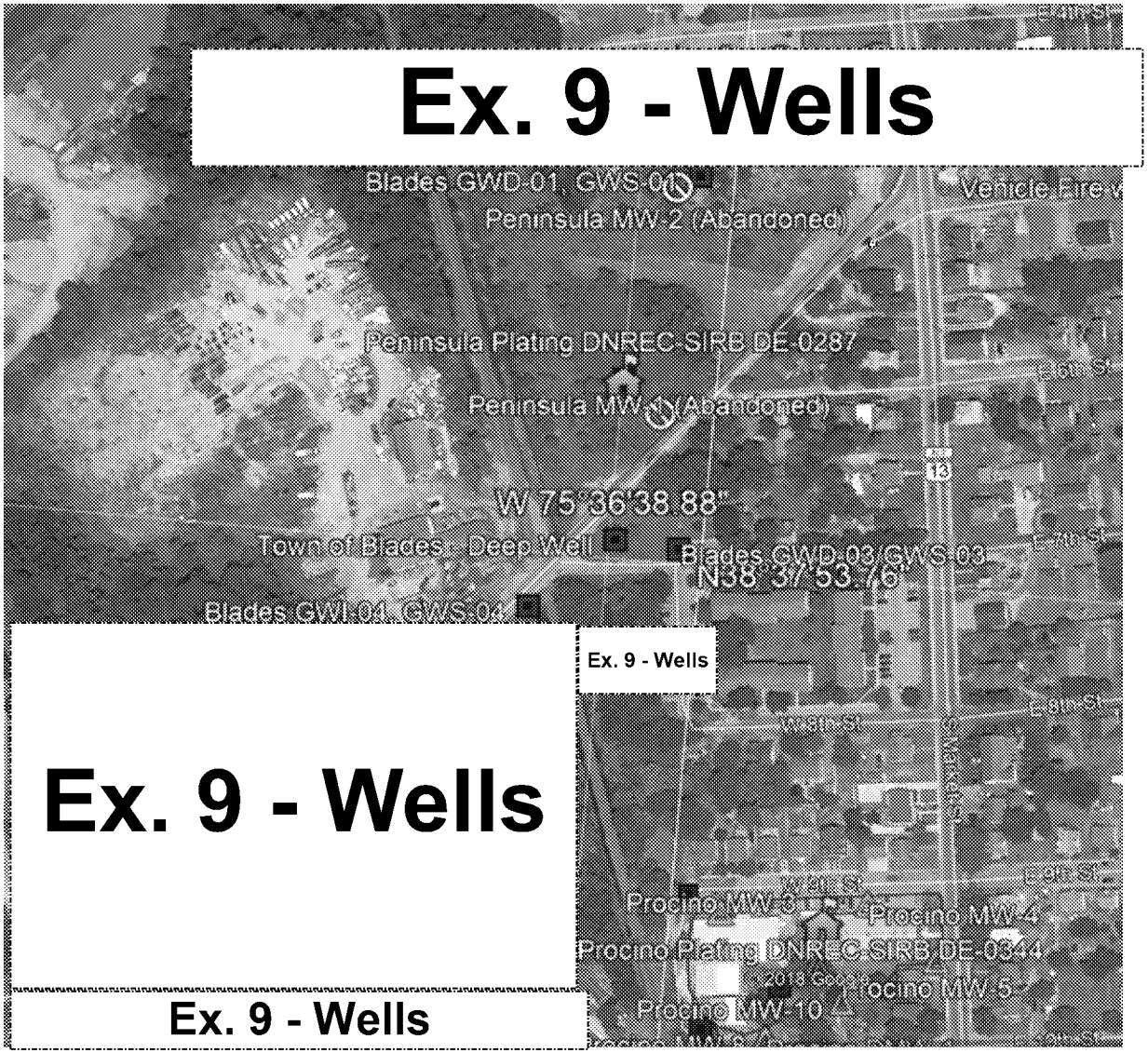
Conceptual Model at the Blades Site



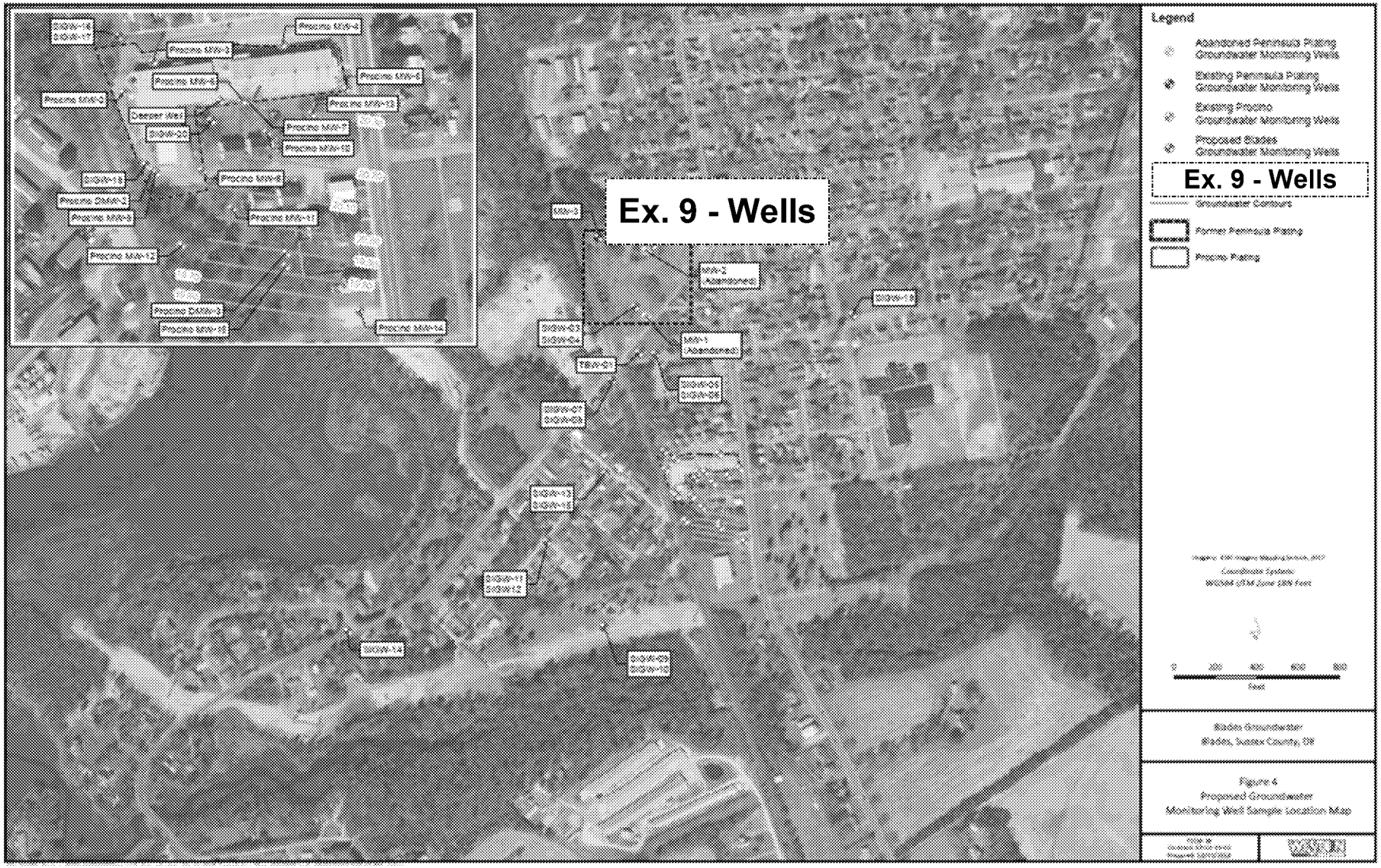
Site Inspection:

- Well Drilling – 18 new well clusters (shallow, intermediate, deep)
- Collected 9 comingled surface water and sediment samples from the Morgan Branch stream and Nanticoke wetland area adjacent to the town.
- Collected groundwater samples from all 18 existing well pairs on the Procino facility.
- Review residential data from the 50 wells. (2 inch wells are installed 40-105 feet)

Conceptual Model at the Blades Site

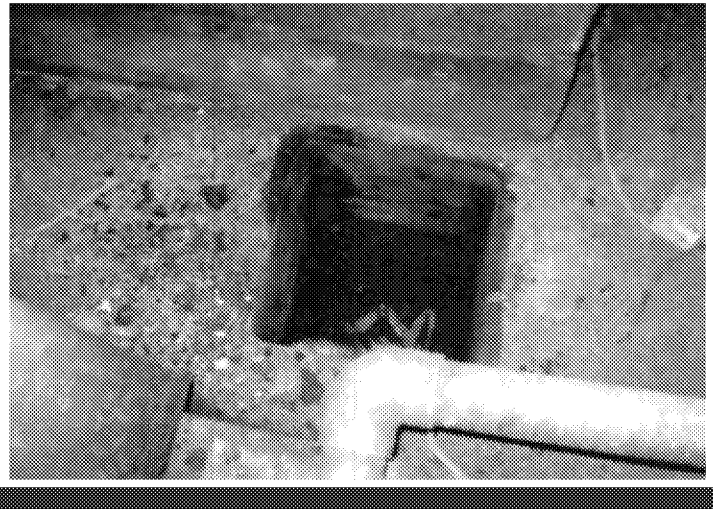


Sampling Design at the Blades Site

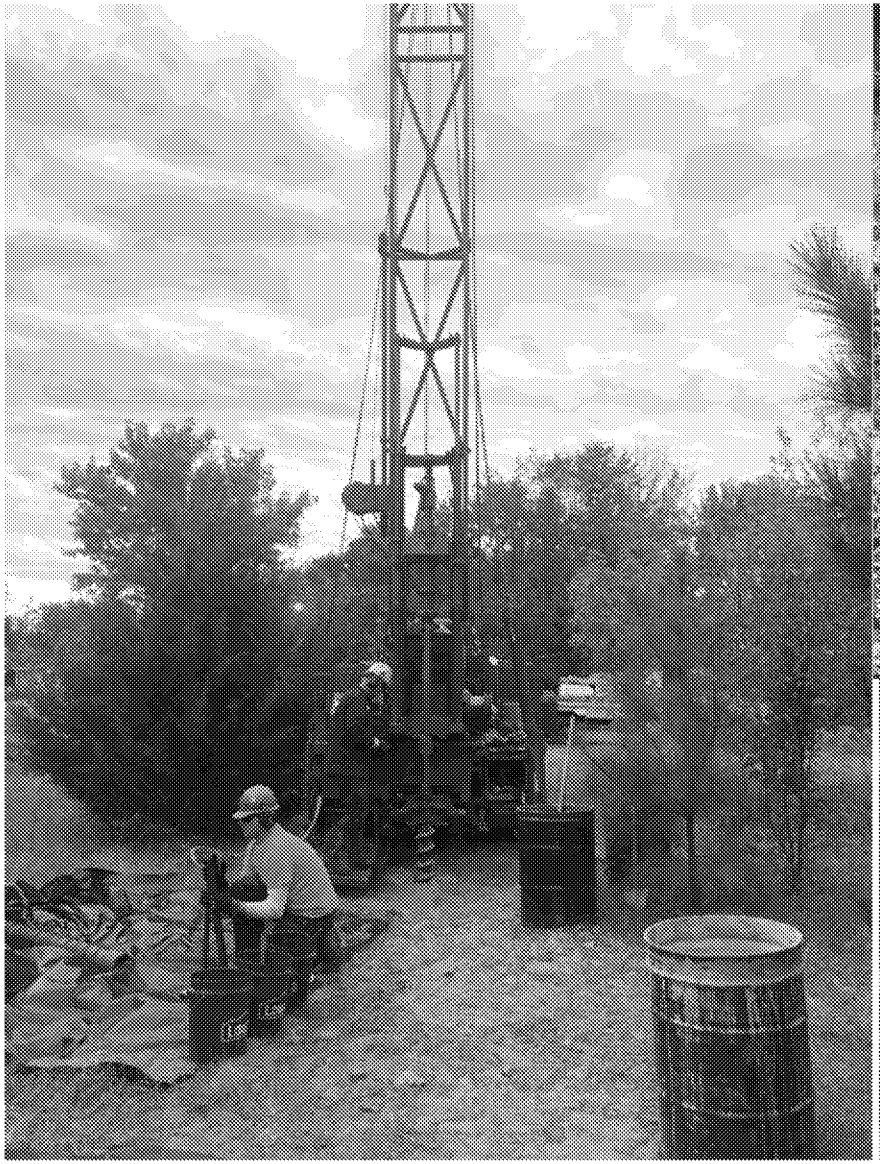


Sampling Strategy at the Blades Site

- Resample the Town of Blades wells for the SI.
- 18 new SI wells
  - Shallow wells are to identify or to eliminate source areas.
  - Intermediate wells are to determine if the two facilities are comingled and to determine hydrological flow direction.
  - Deep wells are to determine if the facilities are comingled and the regional flow/pumping direction and cone of influence of the public wells.
  - Sample 18 existing wells on the Procino Plating facility to determine the extent of a release.
- Collect 9 comingled surface water and sediment samples.
- Review the method of transporting electroplating fluids through onsite water handling systems and onto the sewer system.
- Review site documents



Blades SI - Photographs



Blades SI - Photographs

Blades Groundwater Success Story

- Cooperative Agreement between EPA and DNREC allowed for open communication identifying contamination in the public wells.
- EPA, DNREC and the Town of Blades were able to provide safe drinking water in several days to the public once the sample results were available.
- DNREC and the town installed a public treatment system in several weeks after discovery of PFAS in the public and residential water system.
- EPA's removal group samples residential wells and provided the public with treatment systems.
- EPA is currently conducting the SI in consultation with DNREC.

Any Questions?

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